ture, and that they put out buds and a new growth in the spring. To discover if this be the case he had placed some fragments in water, and while awaiting results he had been surprised at the appearance within a few days amongst the fragments of *Urnatella*, of numbers of the recently described chætobranch-worm, *Manayunkia speciosa*, of Leidy, as well as several living cells of a species of *Paludicella*, probably *P. elongata*, of the same author. The persistence and tenacity of life in these apparently delicate creatures, overcoming not only the severity of a hard winter, but an exposure of several days in the open air, were further commented upon.

February 19.

The President, Dr. Leidy, in the chair.

Thirty-seven members present.

The deaths of Dr. Geo. Engelmann and Prof. Arnold Guyot, correspondents, were announced.

Indian use of Apocynum cannabinum as a textile fibre.—At the meeting of the Botanical Section held on the 18th inst., Mr. Thomas Meehan stated that while it was well known that the fibre of *Apocynum cannabinum* was used by the Eastern Indians in the manufacture of baskets, mats and other articles, he had heard it doubted whether the same plant was used by the Indians in the West. He had interested a lady in Washoe Valley, Western Nevada, to get direct from the Indians of that section stems of the plant used by them. She had done so, and he now exhibited them. They proved to be the same plant, *Apocynum cannabinum.*

The Longevity of Trees.—Professor Sheafer, of Pottsville, Pa., reading an abstract of Mr. Meehan's remarks, in Proceedings of the Academy, had cut and sent for the inspection of members some specimens from Schuylkill county, remarkable for slow growth, of a black oak, *Quercus tinctoria*, in which the annual growths showed in a little over two inches from the centre an average of 36 circles to an inch; one of hemlock spruce, *Abies Canadensis*, 51 to an inch; and one of the common chestnut, *Castanea vesca Americana*, 24 to an inch. Though only four inches in diameter, the oak stem was seventy-six years old; the hemlock one hundred and four years and in diameter four inches; and the chestnut four and a half inches in diameter in sixty years.

With a struggle for life either from poverty of the soil, elevation, or close growth of trees, which the small annual growths

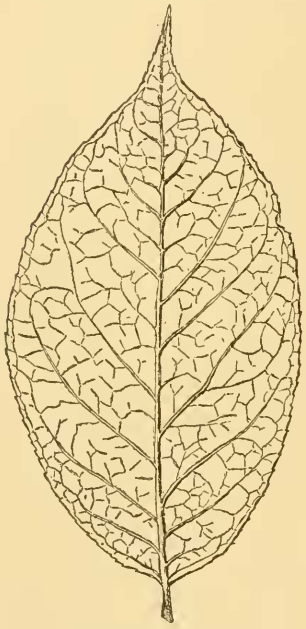
indicated, Mr. Meehan believed the atmospheric conditions, as regards shelter from wind or from drying atmospheric currents, must be very favorable to induce longevity under such circumstances. There seemed to be no reason why these trees might not reach the full average duration of two hundred years, which he had before named as about the duration of most trees of the Eastern United States.

Prof. Sheafer gave some instances indicating that the average might be higher than the figures he had offered.

Parasitism in Boschniakia glabra, E. Meyer.—Mr. Meehan exhibited a specimen of this Orobanchiaceous plant collected by him last summer, growing among alders in the track of the retreating Davidson Glacier, near Pyramid Harbor, lat. 59°, in Alaska, and remarked that the life-histories of this class of parasitic plants were but imperfectly known, and every new fact of interest. In the Yosemite Valley last year, with Mr. John M. Hutchings and Dr. Charles Shäffer, of the Academy, they had carefully dug out masses of earth with the snow plant of the Sierras, *Sarcodes sanguinea*, and then tenderly washed out every particle of earth in a stream near by. There was not the slightest sign of attachment to any root, and no root of anything to be found in the mass of earth. There were not even the slightest remains of any dead vegetation which could suggest that the plant was even a saprophyte, as was generally found in the case of *Monotropa uniflora*. There was nothing but a huge mass of coralline fleshy matter, out of which the inflorescence rose. The origin of this fleshy mass was yet the unsolved mystery. From analogy with the behavior of other plants, he was inclined to believe that there was some parasitic attachment in the early life of the plant, and that it stored up in this coralline mass enough nutrition in one season to support the inflorescence of another, and, after this was done, severed the connection, leaving no trace by the time the mass was large enough to support the heavy drain of the large and juicy inflorescence. In *Boschniakia*, something of this sort had evidently taken place. The plants were in an early flowering stage, and all, when drawn out of the ground, had a single thread-like root depending from the centre of the pseudo-bulbous base of the plant, as in the specimen exhibited. These threads, now hard and wood-like, broke off very easily at the time, and it did not occur to the collector that they might be alder roots, as the density of the substance might now suggest. The desire to botanize over as large a tract as possible in the six hours given by the commander of the ship, did not admit of time to dig down and ascertain directly whether these threads were alder roots, and in direct connection with the living alder plants; but it would be remarkable, if they should be alder roots, and the *Boschniakia* sessile on them, that the plants should all select roots of the same slender size, and so nearly

exactly alike as the twelve or eighteen specimens examined in this way indicated. Mr. Meehan stated that he had, in his *Flowers and Ferns of the United States*, series ii, vol. ii, p. 95, noted the existence of a similar thready attachment at the base of *Epiphegus Virginiana*, evidently connecting the plant with a foster-parent in early life—a fact since confirmed by Mr. Fergus, of West Chester, Pa.; and a fuller examination of these cases might afford the clue to all.

Variation in Halesia.—Mr. Meehan exhibited dry leaves and fruit of *Halesia diptera*, *H. tetraptera*, and of a remarkable departure raised from the last-named species some years ago. This appeared in a bed of seedlings all raised from seed gathered from one tree growing in a garden in Germantown. It attracted attention when one year old by the leaves bearing a resemblance to those of an apple-tree. The parent tree had leaves narrowly lanceolate and acuminate, rather thin, pale green on the upper surface, and with no particularly prominent veins. The plant in question had broadly ovate leaves, scarcely pointed, very dark green and rugose on the upper surface, and strongly veined and hirsute below. It was planted to see what it would come to.



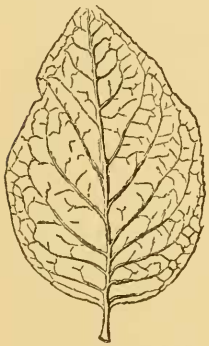
1. *H. tetraptera.*

1*a*. *H. tetraptera.*

The flowers were open cup-shaped, instead of being drawn into a narrow tube at the base, as in the parent plant and the pistil was wholly enclosed and not exserted. For several years the plant was sterile, and many good botanists, whose attention was called to it, regarded the plant as a hybrid, and the sterility as a proof thereof. It seemed of no avail to point out that there was no other species with which the parent could have obtained pollen within many miles, nor to show that hybrids were not necessarily sterile. This season the plant produced fruit for the first time, some of which were now exhibited to the Academy. They are very small, not much over a quarter of an inch in diameter, and the four equal wings were comparatively large and of a strongly coriaceous character. The fruit which had been cut

open were found to have perfect seeds. If the plant with these leaves, flowers and fruit had been found in a state of nature, the botanist would surely have made a new species of it, if indeed he would not have had some doubts of a new genus.

Mr. Meehan then referred to his contributions in the past, tending to show that there was an innate tendency in plants to vary; that this natural tendency was at the foundation of all theories of evolution, and that environment had not near the influence on variation some good botanists claimed for it. If we were to take environment as a serious element of change, there would be no certainty in the direction of change; but a glance at the palæontological and other evidences showed that change had been always in the direction of certain uniform lines, and evidently in accord with a predetermined plan, which the accidents of environment had not been able to override. At any rate, such illustrations as this of the *Halesia* showed a remarkable change with which certainly environment had nothing to do. The seeds were all from one tree, with not even another individual of its own species near it. The seedlings all came up in one bed together, and yet out of many hundred seedlings, all with the same exact conditions of environment, there was not one with even an approach to the singular peculiarities of this.



2. *H. tetraptera*, var.

2 a. *H. tetraptera*, var.

In regard to the sterility or fertility of plants, what we would call environment had evidently much to do, and this also he had endeavored to point out in former botanical contributions. In his paper before the American Association for the Advancement of Science, at Detroit, in 1875, he had shown that Mr. Darwin's experiments in keeping bees from clover, and which in England led to sterility, did not so prove in Philadelphia, the protected plants there being fertile; and he there made the suggestion that the different conditions of environment led to the different results. He had also since then shown that *Linum perenne* in Philadelphia was self-fertile, though in England Mr. Darwin had found that one might as well apply so much inorganic dust to a pistil as the flower's own pollen. Here we have another illustration. The exuberance of vegetative growth being checked by age, or some other circumstance of climate or season, acting against the vegetative and in favor of the reproductive principles—principles we know by many illustrations were antagonistic—gave us this season an environment for the first time favorable to fertility.

The figures are two-thirds the actual size.

The following were ordered to be published:—